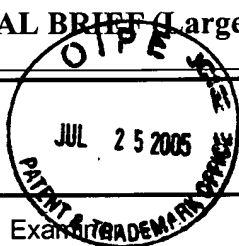


## TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.  
ITL1022US

In Re Application Of: Justin K. Brask et al.



Application No.

10/626,336

Filing Date

July 24, 2003

Examiner

Ori Nadav

Customer No.

21906

Group Art Unit

2811

Confirmation No.

1387

Invention: Forming a High Dielectric Constant Film Using Metallic Precursor

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on June 14, 2005.

The fee for filing this Appeal Brief is: \$500.00

- ☒ A check in the amount of the fee is enclosed.
- ☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 20-1504
- ☐ Payment by credit card. Form PTO-2038 is attached.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

Signature

Timothy N. Trop, Reg. No. 28,994  
Trop, Pruner & Hu, P.C.  
8554 Katy Freeway, Suite 100  
Houston, Texas 77024  
(713) 468-8880  
(713) 468-8883 (fax)

Dated: July 21, 2005

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on

July 21, 2005

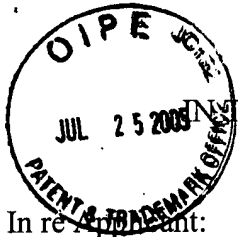
(Date)

Signature of Person Mailing Correspondence

Cynthia L. Hayden

Typed or Printed Name of Person Mailing Correspondence

CC:



Art/2811  
✓

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

Justin K. Brask et al.

Serial No.: 10/626,336

Filed: July 24, 2003

For: Forming a High Dielectric Constant  
Film Using Metallic Precursor

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Art Unit: 2811

Examiner: Ori Nadav

Atty Docket: ITL.1022US  
P16709

Assignee: Intel Corporation

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**APPEAL BRIEF**

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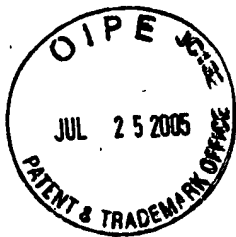
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*Cynthia L. Hayden*  
Cynthia L. Hayden



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**REAL PARTY IN INTEREST**

The real party in interest is the assignee Intel Corporation.

**RELATED APPEALS AND INTERFERENCES**

None.

### **STATUS OF CLAIMS**

Claims 7-13 (Rejected).

Claims 1-6 and 14-26 (Canceled).

Claims 7-13 are rejected and are the subject of this Appeal Brief.

## **STATUS OF AMENDMENTS**

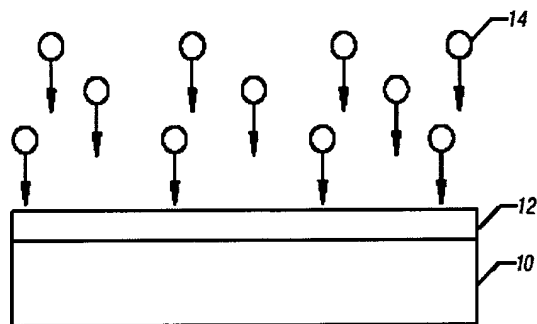
All amendments have been entered.



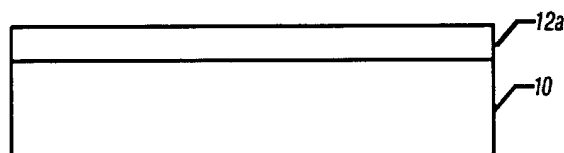
## SUMMARY OF CLAIMED SUBJECT MATTER

In the following discussion, the independent claims are read on one of many possible embodiments without limiting the claims:

7. A method comprising:  
forming a metallic precursor (12, Fig. 1) directly on a semiconductor substrate (10) (Specification at page 2, lines 18-19); and  
oxidizing said metallic precursor (12) in a liquid (Fig. 2, Specification at page 3, lines 3-5).



**FIG. 1**



**FIG. 2**

At this point, no issue has been raised that would suggest that the words in the claims have any meaning other than their ordinary meanings. Nothing in this section should be taken as an indication that any claim term has a meaning other than its ordinary meaning.



**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

- A. Are Claims 7-8 and 10 Unpatentable Over Adan in View of Mizutani?**

## ARGUMENT



### **A. Are Claims 7-8 and 10 Unpatentable Over Adan in View of Mizutani?**

Claim 7 calls for a system which overcomes a problem in that when a metallic precursor is situated over a semiconductor substrate and then oxidized by conventional techniques, an oxide layer forms between the metallic precursor and the substrate. Nothing that has been cited to date in any way intimates any solution to the problem, much less the recognition of such a problem.

The cited reference to Mizutani cannot possibly suggest a solution to such a problem since Mizutani has nothing to do with forming a metallic precursor on a semiconductor substrate. Instead, Mizutani teaches a non-semiconductor substrate that simply would not oxidize. Therefore, Mizutani neither faced nor recognized the problem solved by the present application.

The cited reference to Adan similarly never faces the problem. Since Adan never teaches a metallic precursor on a semiconductor substrate, he does not have the problem. Since he does not have the problem, he cannot possibly contemplate the solution.

It is admitted in the office action that Adan does not teach forming the oxide layers by a method comprising forming a metallic precursor and then oxidizing said metallic precursor in a liquid oxidizer. However, it is suggested that it would be obvious to a person of ordinary skill in the art at the time the invention was made to form Adan's oxide layers by Mizutani's method. Even if one did form Adan's oxide layers by Mizutani's method, one still would not reach the claimed invention. That is because the oxide layers in Adan separate the semiconductor substrate from the gate 6a. Because Adan never is faced with a situation with a metal gate or metallic precursor on the substrate, he can use any technique Mizutani suggests and still not reach the claimed invention. In other words, if Adan was to form his layer 2a by some type of liquid oxidizer, he would have had to have put the metallic precursor on the substrate first. But, plainly, given the thickness of the layer 2a and the description of how it is done, this is not what happened. For example, in column 4, lines 39-42, it is explained that an insulating silicon oxide layer about .5 microns in thickness is grown or deposited and a bottom gate electrode is patterned. It is evident that the oxide is formed first and then the metallic precursor or metallic gate is then deposited.

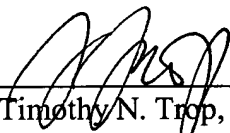
There is no situation where a metallic precursor is formed directly on the semiconductor substrate. In fact, neither reference teaches depositing a metallic precursor directly on a substrate. Thus, the combination of the two references still cannot possibly reach the claimed invention.

\* \* \*

Applicants respectfully request that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,

Date: July 21, 2005



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Timothy N. Trop, Reg. No. 28,994  
TROP, PRUNER & HU, P.C.  
8554 Katy Freeway, Ste. 100  
Houston, TX 77024  
713/468-8880 [Phone]  
713/468-8883 [Fax]

Attorneys for Intel Corporation

## CLAIMS APPENDIX



The claims on appeal are:

7. A method comprising:  
forming a metallic precursor directly on a semiconductor substrate; and  
oxidizing said metallic precursor in a liquid.
8. The method of claim 7 including using a liquid oxidizer.
9. The method of claim 7 using an oxidizer in an aqueous solution.
10. The method of claim 7 including forming a metal oxide dielectric over a silicon substrate.
11. The method of claim 10 including forming a metal oxide dielectric of hafnium, zirconium, or tantalum.
12. The method of claim 7 including depositing a metallic film using physical vapor deposition.
13. The method of claim 7 including oxidizing using a liquid oxidizer selected from the group including solutions of  $O_3$ ,  $H_2O_2$ , and organic peroxide.